

GP 3747
PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit : 3747
Applicants : Tomojiro SUGIMOTO, et al.
Serial No. : 09/094,286
Filed : June 9, 1998
For : FUEL INJECTION VALVE FOR AN
INTERNAL COMBUSTION ENGINE

Assistant Commissioner
for Patents
Washington, D.C. 20231

INFORMATION DISCLOSURE STATEMENT

S I R :

Enclosed is a completed form PTO-1449 listing references which may be of interest to the Patent and Trademark Office in the examination of the above-identified patent application. Copies of the listed references are also enclosed.

The references were cited in an Office Action for co-pending U.S. Application No. 09/094,156. The Office Action was mailed by the U.S. Patent Office on June 30, 1999. A copy of the U.S. Office Action is also enclosed.

I hereby certify that each item of information contained in this Information Disclosure Statement was cited in a communication from the U.S. Patent Office in a co-pending U.S. application no more than three (3) months prior to filing this statement.

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Respectfully submitted,
KENYON & KENYON

By

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Dated: September 27, 1999

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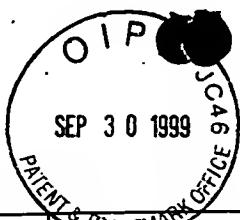
Dated Sept 27 1999 Atty's Reg. # 18,918

Atty's Signature

Edward W. Greason
KENYON & KENYON
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
| 09/094,156 | 06/09/98 | SUGIMOTO | T 10517/5 |

KENYON & KENYON
ONE BROADWAY
NEW YORK NY 10004

QMS1/0630

EXAMINER

HWU, D

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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3752

DATE MAILED: 06/30/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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SEP 30 1999

Application No.
09/094,156

Applicant(s)

Sugimoto et al.

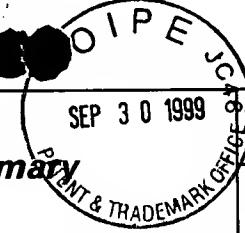
Examiner

Hwu

Group Art Unit

3752

Office Action Summary



Responsive to communication(s) filed on Jun 18, 1999

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

Claim(s) 1-3 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

Claim(s) _____ is/are allowed.

Claim(s) 1-3 is/are rejected.

Claim(s) _____ is/are objected to.

Claims _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on _____ is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) _____.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --



DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Marks et al.

The patent to Matsui discloses a fuel injector valve for a diesel engine which opens and closes to provide fluid flow and having a fuel adjusting plate which contains a plurality of first nozzle holes 13 arranged along a first circle on the plate which is coaxial with central axis of the valve body and a plurality of second nozzle holes 12 arranged along a second circle concentric with the first circle and having a diameter larger than that of the first circle. The holes 13 extend through the plate along a respective axis and the holes 12 extend through the plate along their axis.

Matsui does not disclose the acute angles of the hole axes as claimed in the present invention.

The patent to Marks et al. teaches a fuel nozzle for internal combustion engines having a nozzle piece 1 with fuel passages 4 (Column 2, Lines 78-79) whereas the axes of the passages 4 extend at different angles in order to ensure a proper and even distribution of the fuel in the combustion chamber (Column 4, Lines 11-19). Therefore, it would have been obvious to one of ordinary



Art Unit: 3752

skill in the art at the time the invention was made to have modified the device of Matsui by making the nozzle holes of Matsui to be at different angles as taught by Marks et al. in order to prevent fuel sprays from interfering with each other and thus suitably atomizing the injected fuel.

2. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Marks et al. as applied to claim 1 above, and further in view of Jensen.

The patents to Matsui and Marks et al. disclose the claimed invention except for the recitation of claim 2. The patent to Jensen teaches a fuel injector valve for a diesel engine in which the valve 40 is connected directly into the combustion chamber 12a. Input of the fuel is timed and controlled by a control unit 70. A valve body 41 has a passage 41a which opens into combustion chamber 12a and contains an intake poppet valve 42 having a stem 43 and a face portion 42a at the lower end of the valve stem 43, which gives the appearance of a mushroom shape. At the bottom of the valve housing is a seat 44 for 42a. Spaced axially within the valve housing are valve stem guides 46 and 47 which allow fuel to flow to an outer periphery of face portion 42a instead of the central portion of the mushroom shaped portion of the poppet valve (see Figure 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated into the fuel injector valve of Matsui and Marks et al. a timing device to inject the fuel and a poppet valve whereas the fuel flows to an outer periphery of the mushroom shaped portion of the poppet valve as taught by Jensen in order to make a fuel injector valve which provides uniform and even distribution of fuel to suitably atomize the fuel.

Art Unit: 3752

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents to Kilburn et al., Ishida, Eguchi, and Tarr et al. are pertinent to Applicant's invention in disclosing a fuel injection valve for an internal combustion engine.
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davis Hwu at (703)305-1663.

ANDRES KASHNIKOW
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700



**NOTICE OF DRAFTPERSON'S
PATENT DRAWING REVIEW**

The drawing filed (insert date) 6/9/98 are:

A. _____ not objected to by the Draftsperson under 37 CFR 1.84 or 1.152.
B. _____ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings where necessary. Corrected drawings must be submitted according to the instructions on the back of this notice..

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings:
Black ink. Color.
 Color drawing are not acceptable until petition is granted.
Fig.(s) _____
 Pencil and non black ink is not permitted. Fig(s) _____

2. PHOTOGRAPHS. 37 CFR 1.84(b)
 Photographs are not acceptable until petition is granted.
 3 full-tone sets are required. Fig(s) _____
 Photographs not properly mounted (must mystrol board or photographic double-weight paper). Fig(s) _____
 Poor quality (half-tone). Fig(s) _____

3. TYPE OF PAPER. 37 CFR 1.84(c)
 Paper not flexible, strong, white and durable.
Fig.(s) _____
 Erasures, alterations, overwritings, interlineations, folds, copy machine marks not acceptable. (too thin)
 Mylar, vellum paper is not acceptable (too thin).
Fig(s) _____

4. SIZE OF PAPER. 37 CFR 1.84(F): Acceptable sizes:
 21.0 cm by 29.7 cm (DIN size A4)
 21.6 cm by 27.9 cm (8 1/2 x 11 inches)
 All drawings sheets not the same size.
Sheet(s) _____

5. MARGINS. 37 CFR 1.84(g): Acceptable margins:
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
SIZE: A4 Size
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
SIZE: 8 1/2 x 11
 Margins not acceptable. Fig(s) _____
 Top (T) _____ Left (L) _____
 Right (R) _____ Bottom (B) _____

6. VIEWS. CFR 1.84(h)
REMINDER: Specification may require revision to correspond to drawing changes.
 Views connected by projection lines or lead lines.
Fig.(s) _____
Partial views. 37 CFR 1.84(h)(2)
 Brackets needed to show figure as one entity.
Fig.(s) _____
 Views not labeled separately or properly.
Fig.(s) _____
 Enlarged view not labeled separately or properly.
Fig.(s) _____

7. SECTIONAL VIEWS. 37 CFR 1.84(h)(3)
 Hatching not indicated for sectional portions of an object.
Fig.(s) _____
 Sectional designation should be noted with Arabic or Roman numbers. Fig.(s) _____

8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)
 Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned, so that the top becomes the right side, except for graphs. Fig.(s) _____
 Views not on the same plane on drawing sheet. Fig.(s) _____

9. SCALE. 37 CFR 1.84(k)
 Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction.
Fig.(s) _____

10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l)
 Lines, numbers & letters not uniformly thick and well defined, clean, durable and black (poor line quality).
Fig.(s) _____

11. SHADING. 37 CFR 1.84(m)
 Solid black areas pale. Fig.(s) _____
 Solid black shading not permitted. Fig.(s) _____
 Shade lines, pale, rough and blurred. Fig.(s) _____

12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.48(p)
 Numbers and reference characters not plain and legible.
Fig.(s) _____
 Figure legends are poor. Fig.(s) _____
 Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(3) Fig.(s) _____
 English alphabet not used. 37 CFR 1.84(p)(3) Fig.(s) _____
 Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig.(s) _____

13. LEAD LINES. 37 CFR 1.84(q)
 Lead lines cross each other. Fig.(s) _____
 Lead lines missing. Fig.(s) _____

14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.48(i)
 Sheets not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig.(s) _____

15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
 Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig.(s) _____

16. CORRECTIONS. 37 CFR 1.84(w)
 Corrections not made from PTO-948 dated _____

17. DESIGN DRAWINGS. 37 CFR 1.152
 Surface shading shown not appropriate. Fig.(s) _____
 Solid black shading not used for color contrast.
Fig.(s) _____

REVIEWER *3 Dec* DATE *6/30/98* TELEPHONE NO.

ATTACHMENT TO PAPER NO.



| | | | | | |
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| Form PTO-1468 (REV. 3-29) | | U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | | ATTY. DOCKET NO. | Serial No. |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | 09/094, 286 | |
| (Use several sheets if necessary) | | APPLICANT | Tomoiro SUGIMOTO et al. | | |
| | | CHARGE DATE | June 9, 1998 3-747 123 | | |

| FOREIGN PATENT DOCUMENTS | | | | | | | |
|--------------------------|-----------------|----------|---------------|-------|----------|-----------------------|----------|
| | DOCUMENT NUMBER | DATE | COUNTRY | CLASS | SUBCLASS | TRANSLATION YES NO | |
| 111 | GB-A121 45 95 | 12/70 | Great Britain | | | | |
| 111 | JP 3-11 767 | 25/20/91 | Japan | | | | Abstract |
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|---------------------------------|-------------------------------------|
| EXAMINED <i>John P. Wade</i> | DATE CONSIDERED <i>1/27/2000</i> |
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EXAMPLE 2. Indicate if citation considered, whether or not citation is in conformance with BPPF 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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